1753

Patent
Atty. Docket: H60-056 DIV

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Annita Lise
Dated: 5-7-04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPLICANT	:	Eduard Kugler
SERIAL NO.	:	09/362,397
FILING DATE	:	July 28, 1999
EXAMINER	:	R. McDonald
GROUP ART UNIT	:	1753
FOR	:	INFORMATION CARRIER, METHOD FOR PRODUCING SAME

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

REPLY UNDER 37 C.F.R. 1.193(b)(1)

Sir:

This brief is in reply to the examiner's answer dated March 9, 2004.

Applicant is not requesting an Oral Hearing under 37 C.F.R. 1.194 and instead, requests that the Board decide this case on the basis of the application and the papers filed.

In the following, the arguments and remarks presented will be keyed to sections of the Examiner's Answer which will be identified by page and line numbers or, if concerning more general issues, are provided separately and identified as such.

Where a specific argument or position presented by the Examiner is not addressed in this Reply, applicant relies on its Brief to support its position.

Examiner's Answer - Page 20, Line 20 to Page 4, Line 14:

The Examiner's comment concerning Challener, IV (U.S. Patent 5,414,678) disclosing an increase of storage capacity by only 50% is believed directed to Applicant's comment in the Brief at page 3, line 18, where it is asserted that two or more information carriers can be provided according to the invention and this at least doubles the storage capacity of the information carrier. The Examiner correctly observes that Challener discloses a two-layered data carrier using Kerr rotation and that background to Challener only increases storage density by 50%.

Although this inquiry is not relevant to the patentability of the claims, in fact, Challener at column 5, lines 6-45 actually explains that the storage capacity can be higher than 50% if different laser powers are used. According to the present invention, different frequencies can be used and, in fact, two layers can provide double the storage capacity since the invention is neither limited to Kerr rotation for storing information nor to the use of only two information carriers (all of the independent claims calling for **at least** two solid material interfaces adapted to contain information).

Examiner's Answer - Page 4, Lines 15-16:

The Examiner holds that Challener and the present claims only differ in that the silicon nitride layer of Challener is deposited by sputtering, which is not disclosed by Challener. This ignores the fact that silicon nitride is only one of a multitude of dielectric layer materials disclosed by Challener and that the difference between Challener and the present invention is not only the manner of deposition of the silicon nitride, but the specific selection of silicon nitride from among a host of other possible candidates for the critical intermediate layer between the at least two information carrying layers.

Examiner's Answer - Page 4, Lines 17 to Page 5, Line 7:

The Examiner correctly observes that Kim, et al (U.S. Patent 5,240,581) discloses sputtering of silicon nitride in a nitrogen atmosphere. Holding that it would be obvious to use this technique of Kim to modify Challener does not, however, take into account the fact that Kim is directed to a protective outer layer which has very different optical requirements than an intermediate layer between two solid material interfaces adapted to contain information. Even if Kim teaches controlling gas flow during sputtering in order to control the thickness of the deposited film, as noted by the Examiner later in the Examiner's Answer (e.g., the paragraph bridging pages 18 and 19 of the Answer), the refractive index is a characteristic of layer material and not layer thickness.

In order to avoid repetition, Applicant relies on its Brief with regard to the Examiner's comments on pages 5-17 of the Examiner's Answer.

Examiner's Answer - Page 18, Beginning at Line 6 (Group A - Claims 91, 103, 104):

In reply to the Examiner's response to Applicant's arguments, it is again noted that Challener does not teach specific selection of silicon nitride over any of the other dielectric materials disclosed, nor does Kim instruct the skilled artisan on how to formulate an intermediate layer but instead, how to deposit a protective layer of far less critical optical characteristics.

Examiner's Answer - Page 19, Beginning at Line 7 (Group B - Claims 92, 103, 104):

Challener does not teach depositing SiNH at all.

Since SiNH can also be deposited out of a gaseous phase, e.g., using Silane, a reactive vacuum coating process using a solid body with Si is not compulsory. Why then should the skilled artisan apply the deposition method known for significantly less critical

deposition of protective layers to the deposition of the far more critical intermediate layer between information layers?

For the intermediate layer, several optical characteristics are important, including the transmission of the layer, its refractive index and its extinction coefficient. According to the claimed invention (e.g., Claim 92), an optimum of transmission and of refractive index is achieved by adjusting the concentration of the reactive gas which is not taught by either Challener or Kim. For this feature, the Examiner relies on European Application No. 0 473 492 to Tawara, et al, with only one information layer and no intermediate layer between information layers.

Examiner's Answer - Page 20, Beginning at Line 5 (Group C - Claim 93):

It is significant that a silicon compound is not necessarily deposited on a layer making use of a solid body target. It is a very well known process in CVD (Chemical Vapor Deposition) or PECVD (Plasma Enhanced Chemical Vapor Deposition) to deposit silicon compounds out of a gaseous phase, e.g., making use of Silane.

Part of the present invention is the Applicant's recognition that the respective important optical characteristics; namely, transmission, refractive index and thus also extinction coefficient, may be optimized for the particular application of an intermediate layer between information layers, by the reactive vacuum coating process which is **not** realized out of the gaseous phase, but which makes use of freeing silicon from a solid body. In view of the criticality of the optical characteristics for the intermediate layer selecting one technique over another cannot simply be ignored.

Examiner's Answer - Page 20, Beginning at Line 9 (Group D - Claim 94):

Selecting features from three references combined (Challener, Tawara and Kugler, U.S. Patent 5,292,417), the Examiner considers Claim 94 obvious to the person having ordinary skill in this field. Kugler, however, does not teach the control of gas ratios to

optimize the optical behavior of a dielectric layer. In the context of Kugler, the reactive gas ratio is controlled to try and control the working point of the reactive sputtering process in the unstable transition mode. This does not touch upon tailoring critical optical characteristics for an intermediate layer between information layers and would not motivate the skilled artisan to compose the intermediate layer of SiNH (as in Tawara) or provide this specific composition for the intermediate layer between information layers of Challener (which lists a host of other dielectric materials, but not SiNH).

Examiner's Answer - Page 20,
Beginning at Line 18 (Groups E, F, G, H - Claims 95-102):

By holding that the claims in these groups would be obvious by drawing features from three or more references and combining them to reach the claims, the Examiner does not fully consider a very tenuous balance being struck by Challener. On the one hand, Challener teaches that the formation of an intermediate layer is very critical. On the other hand, however, Challener discloses a large number of different materials, which are not equally suited to resolve such criticality with respect to the various techniques available for depositing the materials, but not taught by Challener. The Examiner relies on secondary prior art which discloses the deposition technique of the claimed invention, but for depositing much less critical protective layers. The skilled artisan would not find it obvious to select various deposition approaches from the secondary references and apply them to Challener, which teaches higher criticality for an intermediate layer, but at the same time, a wide variety of materials that can be used in that layer.

Examiner's Answer - Page 21, Beginning at Line 3 (Group I - Claim 105):

The skilled artisan will not select a wavelength according to the pre-established thickness of a layer, but the layer will be tailored according to a selected wavelength.

Claim 105 defines the application of the dielectric layer following the rules of an interference technique.

Examiner's Answer - Page 21, Beginning at Line 8 (Group J - Claim 106):

Other metals are well known for performing laser reflection such as aluminum or gold. The selection of silver for this layer has advantages that dovetail with the other features of the invention, as defined in either Claims 91 or 92, and is structurally and patentably different from using other possible metals. The fact that neither of the references cited in the combination applied against Claim 106 defining silver as the reflective material, only increases the distinguishability of this claim over the prior art.

Examiner's Answer - Page 21, Beginning at Line 13 (Groups K, L. Q, R - Claims 107, 108, 114-116, 119, 120, 131):

Challener teaches no link between thickness of the layer and wavelength of light and thus necessarily no rules for applying the layers according to interference filters. Simply teaching the possible thickness of 10-150 nm for the intermediate layer does not teach the skilled artisan that certain thicknesses within this range are better than others, nor how to obtain these better thicknesses.

Examiner's Answer - Page 21, Beginning at Line 19 (Group M - Claims 109, 113, 117):

Whenever a recording disk is manufactured, one knows exactly for which use it is to be put. Thus, the wavelength to be applied is pre-established. It is not true that one selects a wavelength of light in order to achieve a desired reflection for a given recording disk.

Examiner's Answer - Page 22, Beginning a Line 4 (Group N - Claims 110, 118):

Here again, Challener's disclosure of a wide thickness range of 10 - 150 nm does not provide the skilled artisan with sufficient teaching to reach Claims 110 or 118. As noted above, Challener teaches a multitude of different materials in addition to the relatively wide

range of thicknesses. These two large areas of variability suggest nothing to the skilled artisan of the criticality of Claims 110 and 118. Only by trial and error, would the skilled artisan select the right combination of material and thickness to achieve the index of refraction and extinction coefficients defined by these claims.

Examiner's Answer - Page 22, Beginning at Line 10 (Group O - Claim 111):

It is exactly because Challener suggests "similar materials" that the skilled artisan is taught by Challener that the selection of material is not critical. This is exactly contrary to Claim 111, which (further limited by Claim 107) defines two specific compounds only from which to select the intermediate layer material.

Examiner's Answer - Page 22, Beginning at Line 15 (Group P - Claim 112):

As already observed by the Examiner, Challener teaches a recording medium involving Kerr rotation and thus, a magnetic optical recording medium. This clearly does not involve thickness variations of the material of the information layers.

Examiner's Answer - Page 22, Last Line (Group S - Claims 123 - 127):

Applicant relies on the arguments in the Brief and advances no further arguments here.

Examiner's Answer - Page 23, Beginning at Line 5 (Group T - Claims 121, 122):

These claims define the combination of deposition technique of their base Claim 107 with the deposition of zinc, hafnium or titanium nitride dielectric layers. The combination of Challener which discloses none of these materials for the intermediate layer between two information carrying layers, with Sproul, et al (U.S. Patent 4,428,811) which discloses these materials but for workpieces having no optical characteristics, is not seen as being obvious in any sense contemplated by 35 U.S.C. 103.

Examiner's Answer - Page 23, Beginning at Line 10 (Group U - Claims 128-130):

Kugler teaches doped targets in context with influencing process behavior. It clearly does not teach doping a layer as called for in Claims 128-130.

Applicant relies on its Brief for its position with regard to the Group V and Group W claims.

General Considerations:

Throughout the prosecution of this application, applicant has tried to emphasize the criticality and significance of its various techniques for producing an intermediate layer between information carriers that must have critically selected and achieved optical characteristics.

This is because the intermediate layer is positioned between two information carriers and must convey light which has many chances for deteriorating before it can be read. The light first passes through any number of protective layers, then through the intermediate layer and then passes through or is reflected from the second information carrier layer to pick up the information. Its journey has not ended, however, since it must now return through the intermediate layer, through the first information layer and through the protective layers before it can be read.

The intermediate layer must also not deteriorate the information picked up from the first or outer information carrying layer. The criticality of this intermediate layer is much higher than that for any of the protective layers. Although Challener appears to suggest this increased criticality for the intermediate layer, it supplies insufficient teaching to reach all of the claim limitations of the various claims and groups of claims in this application. The examiner thus relies on the secondary references, but none of these deal with

intermediate layers but rather, discuss techniques for creating protective layers or other types of layers altogether. The skilled artisan is asked to ignore the distinction between a protective layer, or even a workpiece, and an intermediate layer and to ignore the much more convoluted and demanding optical pathway for light reaching through the intermediate layer.

From the foregoing and for the reasons advanced in the Brief on Appeal, the Board is respectfully requested to reverse the Examiner's decision, and find all of the claims unobvious and patentable over the prior art.

This Reply is submitted in triplicate.

No fees are necessary. However, the Commissioner is authorized to charge or credit any fee, that may be required, to Deposit Account No. 14-1431.

Respectfully submitted,

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